

UNIVERSITY OF NOTTINGHAM



DEPARTMENT OF PSYCHOLOGY

Research into Blind Mobility:

A Look Forward into 1971.

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Department of Psychology,
University of Nottingham.

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This is the third short annual account of our activities. On the whole I shall follow the same headings as last year.

General.

In March of this year the second five year period of our major grant from MRC/DHSS began, and July saw the two year extension of the St. Dunstan's grant. Under the extended arrangements Dr. Heyes joined the Unit as the additional post-doctoral fellow and Mr. Campbell as the mobility instructor. Dr. Heyes is specifically in charge of the new project on the mobility problems of the deaf-blind (see below) as well as taking over prime responsibility for instrumentation, while Mr. Campbell has taken over most of the training functions of the Unit, both for blind trainees and sighted subjects working under the blindfold.

Dr. Armstrong and I visited the United States in the summer and were able to bring ourselves up to date on most current developments in research and practice. A report on this visit is available (Leonard and Armstrong, 1970). (a) At a meeting called by the Sensory Aids Subcommittee of the National Academy of Engineering, I presented a paper in which the present position and future problems are outlined (Leonard, 1970). (a) This paper looks at the mobility needs of the blind user population from various points of view and shows the extent to which they can be said to have been met already. It also points out that we need to look for quite a different order of complexity in any future devices which could be said to constitute a significant advance on the present position for a significant proportion of the user population.

Whatever we do here makes sense only in the context of practical implementation as well as being a contribution

to knowledge. For such implementation those who provide services are of course primarily responsible." In a more general paper some thoughts on the future of such services were presented (Leonard, 1970).(b)

Measurement of Performance.

We ran into a number of instrumentation problems with our 'vertical accelerator meter' so that for the time being we have restricted ourselves to frequency measures only, i.e. we can get data for step-frequency and we can distinguish between subjects walking and stopping. This is in fact what we did for an exercise with six blind boys from Worcester College and with six sighted boys. The main point of interest to arise from that particular comparison was the very remarkable consistency of step frequencies for both blind and sighted - though there are some distinguishing features. We are carrying out work at the moment to relate step frequency and stride length. We hope to improve instrumentation in the coming year so that we can take amplitude into account again.

A further extension of recording is being made by the use of portable video equipment. This allows one to take a continuous visual and auditory record which one can inspect immediately and put selected items on film for permanent recording. It should also be possible to record various other outputs simultaneously with the video component, e.g. heart-rate or the signals from the sonic aid.

Long Cane/Orientation.

It is good to report that during the last year we were able to combine research and 'service' activities as never before. We hope to be able to continue this dual function in the future.

Mrs. Peel concluded her work on long-cane training with a six week exercise at Worcester College. Here, with six blind boys of widely varying abilities she was able to put into practice the various aspects investigated under more tightly controlled conditions in the laboratory. The rest of the Unit supported her in an evaluation exercise in which the boys were filmed and assessed before, during, and after training. It is hoped to have a report on the evaluation out in the early part of the coming year, while the whole of Mrs. Peel's work should be available later on during the year.

Since joining the Unit Mr. Campbell has had seven blind trainees under various forms of training. One case provided us with our first opportunity to observe the progress of a highly motivated, recently blinded man in his early sixties. Four of the trainees were girls home on school during the summer vacations. Here we tried to combine research on a four weeks' 'crash course' with a direct service to youngsters at home. The others were both straight training cases. Where possible films were taken before and after training and a detailed report on the vacation exercise will be circulated shortly (Campbell, 1971).

Apart from this, sighted subjects continue to be trained for various experiments, and by this time about like half the members of the Unit have reached various levels of proficiency under the blindfold.

Long Cane/Orientation training as such is clearly one of the areas in which one looks forward increasingly to contributions from practitioners. As more and more mobility officers gain longer term experience with a wider range of trainees a great deal of information should be forthcoming.

This forms the topic of papers and discussions at meetings of instructors of which we had one here early in 1970. This meeting provided an opportunity for reports of work with maps, follow up, and refresher courses. It also gave us a first chance to show the films taken in the course of the client evaluation of the Midlands Mobility Centre in July 1969. A report of that evaluation has now been circulated (Crouse & Leonard, 1970).

As mentioned in last year's report, one is now beginning to see more clearly the limits of achievement of long-cane/orientation training. Mrs. Peel has begun a project which seeks to bring together several aspects of training experience, with particular emphasis on the relation between difficulties experienced during training and performance after training.

Foldable Cane.

We have continued to support efforts to produce a foldable long cane by making up a small batch to a design by Mr. J. Pickles so that they can be tried out in conjunction with others made available through the National Mobility Centre.

Sonic Aid.

Handheld. In March we held a meeting of all those 'Satisfied Sonic Aid Users' who were able to accept a widely circulated invitation. The format of this meeting was part discussion and part practical work. All those present told us of their experiences, their solutions and their remaining problems. We were able to observe a good many of the people concerned walking over test routes and obstacle courses. We came to the conclusion that only a very small number of those present could be said to make effective use of the Aid in mobility situations, but those who did put up remarkable performances. The meeting agreed that the provision of sighted instructors would be very desirable. (Leonard & Armstrong, 1970).

In September Mr. R. Sharpe, Mr. D. Campbell, and Dr. J.D. Armstrong ran a five day course on Sonic Aid Instruction. Those taking part were seven mobility instructors who had previously been trained in long cane/orientation at the Mobility Centre in Birmingham. This course was intended to teach the instructors how to teach the use of the Aid to blind people. As far as we were able to judge from the performance of the instructors as well as their comments the course was a success. If there should be further need for us to run such courses we will do so in the coming year. (Sharpe & Campbell, 1970).

It will be recalled from last year's report that Mr. R. Sharpe had carried out an evaluation of the Elliotts Training Manual for the Sonic Aid, sponsored by St. Dunstan's. With the activities reported above, it will be seen that we have followed through a meaningful sequence of activities leading right up to a demonstration of the feasibility of providing Sonic Aid instruction training to already qualified mobility instructors. It is to be hoped that most mobility instructors in the country will be able to offer this training to any blind person who so desires it and who is considered to be suitable.

Mr. Sharpe spent some time at Birmingham to instruct the National Mobility Centre's principal in teaching methods for the sonic aid, and it is good to be able to report that this will now result in the rest of the staff at N.M.C. receiving training.

Headmounted. During the year Dr. Armstrong completed the field work with this device by training a further three blind people. There has also been extensive follow up of all those blind people who had taken part in the exercise. All his subjects approved and initially accepted the

device. All continued use for some weeks after training. Finally, there are now four who use the device continuously for mobility purposes. Most of those who have stopped use, did so because to them the gain was not worth the awkwardness inevitable with an experimental device. Given that awkwardness, the continued use by four out of nine subjects is perhaps all the more remarkable..

It is on account of these results that one is now able to say that it is possible to provide complete body-protection as well as a measure of environment sensing to those who want to combine long-cane with a headmounted sonic aid. This is by no means an ideal solution, but for the time being, at least in this country, it is the only one available and tested. (Armstrong, 1970).

Preliminary work with a filter reducing the effective range and beamwidth of the Sonic Aid output suggests marginal benefits only in a crowded environment. We expect to do more work with this adjunct.

Dr. Armstrong and Mr. Espin completed their laboratory comparison of various display modes with the result that there was no apparent difference between three methods of signalling range: pitch change as in the Kay Sonic Aid, loudness of white noise, and loudness of a pure tone. In the static laboratory situation at any rate there was nothing to chose between these three. We are now looking forward to field experiments to be carried out this spring.

Heartrate.

Mrs. Peake completed her laboratory study on the interaction of one 'physical' and two 'psychological' stresses with sighted subjects. For us the most crucial result was that heartrate was less affected when adding a psychological stress to a high level of physical activity than when adding it to a low level of physical activity: blind people walk more slowly over more complex routes than over a very simple route, so that their 'control' levels for the physical activity of walking are different.

Mrs. Peak also extended her work with users of different aids to mobility by enlarging her original subject groups. The results so far confirm our earlier observations: there do not seem to be any gross differences between different users but more detailed analyses are being carried out. The results of her earlier work are due to be published later (Peake & Leonard, 1971).

We had a chance of observing one of our most able long-cane travellers before and after an operation which restored most of his guiding vision. Before the operation he, like all other blind subjects, had a higher heartrate when walking unguided than when walking guided. After the operation there was no more difference between guided and unguided heartrates. This finding was perhaps the most crucial test of our assumption that the guided heartrate can be considered as a meaningful control value for each blind person and that it does represent a meaningful 'sighted' minimum.

If at all possible we hope to go on now to examine a range of residual vision cases, before and after mobility training.

The report on the methodology work carried out by Miss Leigh on sighted subjects is now available (Leigh and Leonard, 1970).

Thus, heartrate continues to be a useful objective measure of stress in blind travel, even though we may not be able to separate out the different sources of that stress. It could help us to a clearer definition of the border between having and not having 'guiding vision'.

Child Development.

Dr. Heather Wood completed her work and submitted it in a dissertation entitled "Problems in the Development and Home-Care of Preschool Blind Children". It is hoped to have this published in full. Based mainly on interviews of some seventy mothers of blind infants we have here a very full picture of the variability of development, compared where possible with the development of a blind and a sighted peer group. The work highlights the problems encountered and the ingenuity of mothers in solving these problems. (Wood, 1970).

Relaxation Training.

Mr. R. Sharpe has, in the past year, been concerned with techniques for increasing performance on complex tasks which precipitate stress and anxiety in the performers. Three main techniques are being investigated - two of which are designed to reduce the anxiety induced by the task (using relaxation techniques) and one of which concentrates on training the performer how to cope with the anxiety (using rational therapy) - with the following, as yet tentative, conclusions. The rational therapy is

highly efficient in increasing performance while not significantly reducing anxiety levels; one of the relaxation techniques is also efficient in increasing performance while also lowering anxiety levels. In terms of time and effort needed to administer the treatments, the rational therapy is very simple while the other techniques are rather more involved. Thus, it might appear that performers with moderate anxiety levels might be most conveniently treated by rational therapy while the anxiety reducing techniques might be reserved for those cases of very high anxiety levels - bordering on phobia - where general lowering of emotional arousal is indicated.

It is hoped that the results so far obtained will be applied next year in the field of blind mobility with the object of using the techniques with blind trainees.

Deaf Blind Mobility.

Dr. Heyes and Mr. Gazeley have started work on this project which is the first of ours to deal with the needs of a special and fortunately small group of blind people. We have started to make contacts with organisations and individuals in order to get to know the nature and the size of the problem. In the coming year we intend to continue this part of the activities and start some laboratory work on the effectiveness of hearing aids for various mobility requirements. At this very early stage one must assume that there will be a range of solutions embracing modifications of standard mobility training, use of hearing aids, and modifications of guidance devices.

To Sum Up.

"1969 saw the beginning of a change of emphasis from the examination of the situation as it is to a possible improvement along a number of fronts. We expect to maintain this shift of emphasis in the coming year and do not think that this will be reflected in any one very spectacular breakthrough". It so happened that during 1970 work has continued pretty steadily and that in one way or another 14 blind people received training from members of the Unit - not all of them successes. We have had more opportunities to clarify our thoughts about the problems of blind mobility, the extent to which they had already been solved, and the kind of solutions which might be required to take matters significantly further for a significant number of blind people. A great deal

could be done here and now to raise the levels of mobility on the basis of knowledge and facilities already available in this country, if those concerned consider the effort worth the gains. The immediate future will no doubt see improvements in electronic devices which will help some blind people. But the breakthrough has to come as the result of better means of presenting relevant information, and presenting it simultaneously rather than sequentially as at present.

As far as this country is concerned we have helped to provide both the knowledge and the facilities mentioned above. There is much less need for that kind of activity now on our part since there is an increasing number of people working at the practical level, both here and in the United States. It remains my hope that we will be able to continue to work together with all others concerned in this work, blind people, practitioners, and administrators. I think that we have shown over and over again that there can be a useful traffic of ideas among all those concerned. I think we have also shown that there need not be a rigid separation between research and practice. But it is only right to draw attention to the fact that the manner in which the traffic is being conducted leaves a great deal to be desired. With one or two notable exceptions it has been left almost entirely to us to make the first move.

We have now in this country both training and research facilities for mobility problems. Both have their parts to play and should be encouraged to work together towards common goals. I hope that 1971 will produce some such encouragement.

Nottingham, December 31st, 1970.

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